

Patent Claims

1. A gas turbine, in particular an aircraft engine, comprising at least one compressor (15, 16), at least one combustion chamber (17), at least one turbine (18, 19), and at least one generator (20) for generating electrical energy, the or each generator (20) having at least one stator (25) and at least one rotor (22), characterized in that the or each rotor (22) of the or each generator (20) is designed as a free-running generator turbine which, driven by a gas flow, rotates relative to the respective stator (25) of the respective generator and generates electrical energy from the kinetic energy of the gas flow.
2. The gas turbine as recited in Claim 1, characterized in that the gas turbine furthermore has a fan module (11) having at least one fan (12), the or each generator (20) being positioned downstream from the or each fan (12) in such a way that the or each free-running generator turbine of the or each generator (20) is driven by a gas flow of the or each fan (12).
3. The gas turbine as recited in Claim 2, characterized in that the or each generator (20) is integrated into a generator module (26), the generator module (26) being detachably connected to the fan module (11) situated at the downstream end (21) of a fan flow channel (14).
4. The gas turbine as recited in one or more of Claims 1 through 3, characterized in that the or each generator (20) generates electrical energy from a bypass gas flow of the fan module (11).
5. The gas turbine as recited in one or more of Claims 1 through 4, characterized in that the or each rotor (22) designed as a free-running generator turbine of the or each generator (20) has multiple rotating blades (23) having pole pieces (24) assigned to blades (23).

6. The gas turbine as recited in Claim 5,
characterized in that the pole pieces (24) are assigned to radially outside ends of the rotating
blades (23) of the or each rotor (22) designed as a free-running generator turbine, the respective
stator (25) of the generator enclosing the rotor (22) radially on the outside.

7. The gas turbine as recited in Claim 5,
characterized in that the pole pieces are assigned to radially inside ends of the rotating blades of
the or each rotor designed as a free-running generator turbine, the or each rotor enclosing the
respective stator of the generator radially on the outside.

8. The gas turbine as recited in one or more of Claims 1 through 7,
characterized in that the or each rotor (22) of the or each generator (20) designed as a free-
running generator turbine has a small number of blades than the or each fan (12) of the fan
module (11).

9. The gas turbine as recited in one or more of Claims 1 through 8,
characterized in that the or each generator has multiple generator stages, each generator stage
being formed by a rotor designed as a free-running generator turbine and an associated stator.

10. The gas turbine as recited in one or more of Claims 1 through 9,
characterized in that the blades (23) of the rotor (22) designed as a generator turbine are
adjustable for adjusting the angle of incidence of same.

11. The gas turbine as recited in one or more of Claims 1 through 10,
characterized in that the or each generator is positioned downstream from a low pressure turbine
of the gas turbine, kinetic energy of the gas flow exiting the low pressure turbine being thereby
converted into electrical energy.

12. The gas turbine as recited in one or more of Claims 1 through 11,
characterized in that one generator is positioned downstream from the fan module and an
additional generator is positioned downstream from the low pressure turbine, kinetic energy of

the gas flow exiting the fan module and kinetic energy of the gas flow exiting the low pressure turbine are converted into electrical energy.